165970 #29

REMEDIAL ACTION PROPOSAL FOR PORTAGE CREEK

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PREFACE

This proposal has been prepared by counsel for Allied Paper, Inc., and HM Holdings, Inc. ("Allied") in conjunction with its consulting engineers. This proposal shall not be construed as an admission by Allied that any particular remedial alternative is required or appropriate, nor shall this proposal be construed as any admission of liability for remediation of the PCBs in Portage Creek. This proposal is submitted to the State in the context of settlement discussions relating to various potential remedial alternatives.

I. INTRODUCTION

In recent months, as a result of status conferences held with the Court, Allied has completed substantial additional sampling of the Bryant Mill Pond and Portage Creek to supplement the data concerning PCBs in that area. Preliminary cost estimates were developed by Allied that covered a range of removal, stream diversion and containment alternatives. Most recently, Allied completed a comprehensive preliminary risk assessment report covering a series of potential remedial alternatives.

In order to facilitate settlement discussions, Allied presents this proposal for remediation to the State. We expect that the State may have several questions about the proposal and Allied's counsel and consulting engineers are ready and willing to meet to discuss any such questions.

II. SUMMARY OF PROPOSAL

Allied examined various removal, diversion and containment alternatives, and has prepared preliminary cost estimates and risk assessments for several possible alternatives.

Allied proposes an interim remedial action in the nature of diversion of Portage Creek to separate the creek from the PCB contaminated sediments in Bryant Mill Pond. The proposal is specifically intended to be interim in nature and is not proposed as the final remediation of PCBs in Bryant Mill Pond. However, the interim proposed diversion is expected to be very effective in and of itself toward mitigating releases of PCB from the Bryant Mill Pond sediments.

Allied proposes that additional sampling, monitoring, investigation and studies be conducted during a period of 2 to 5 years after diverting the creek; upon conclusion of that period a final remedial action plan would be prepared by Allied and submitted to the State and the Court.

III. REASONS FOR SELECTION OF INTERIM REMEDIAL ACTION

There are essentially four types of remedial action alternatives that apply to Portage Creek: 1) No Action, 2) Removal, 3) Containment, 4) Stream Diversion. Certain combinations of these alternatives could be used; as well, certain newer, developing technologies could be used in combination with one or more of these alternatives.

All of the above alternatives have been discussed and examined in detail by Allied and its consultants. Allied is not now proposing and has never proposed that no action be selected as the appropriate remedy. On the other hand, there are various unknown and unpredictable issues associated with either containment or removal. Diversion, which is being proposed here as an interim remedial action, is in the opinion of Allied, a required step in either containment or removal as final remedial actions. Allied does not concede that its previous remedial proposals (containment with or without impoundment) would not have been effective or successful.

The no action alternative is used as a base line against which the adequacy of diversion as an interim action can be measured.

There are several problems associated with either containment or removal at this time. They include implementability, effectiveness, and cost. Pursuit and implementation of the proposed stream diversion interim action would allow further assessment of those factors and others before any final remedial action plan is selected.

There are several affirmative reasons which support the interim diversion proposal:

A. Short term effectiveness. As demonstrated in the risk assessment report and discussed later in this report, diversion of Portage Creek will have a substantial and significant effect on the risk to human health and the

environment posed by the PCBs in Portage Creek. This step would essentially remove the need for unnecessary haste in developing a final remedial action plan.

B. Reduction of Mobility of PCBs. One of the main concerns expressed by the MDNR has been the scouring action of Portage Creek as it passes through and over the PCB contaminated sediments in Bryant Mill Pond. Although perhaps not fully understood, it is undisputed that the stream action contributes to some increase of PCBs in the water column and to the downstream migration of PCB contaminated sediments. The proposed diversion almost totally eliminates this concern.

C. Implementability. Technically, the stream diversion is readily implementable. Most importantly, diversion seems to be a common first step to either containment or removal and thus, little is lost by proceeding with the interim diversion proposal. Finally, there are many more difficult feasibility and design considerations to be addressed and resolved for either containment or removal, negotiation of which could consume many, many months. Diversion can be started and completed in a relatively short period of time.

D. Long Term Effectiveness. An evaluation of the long term effectiveness of any remedial action requires prediction of the risk to human health and the environment long after the remedial action has been completed. Predictions are based on present facts and future assumptions. The more complete the present data base, the more reliable the future prediction. The fewer the assumptions, the better the future predictions. The interim remedial proposal will allow for this accumulation of additional data concerning both containment and removal and thus will contribute to the ability to more reliably determine the long term effectiveness of a final remedial action plan.

E. Cost. The proposed diversion will not be inexpensive. As with any remedial activity there are substantial risks of contingent costs not presently anticipated. By comparison, however, the cost of interim stream channel diversion is far less than cost of removal ($15 to $40 million) or containment. As an interim measure, diversion is cost-effective.

The goal of any remedial action plan for Portage Creek should be to reduce fish PCB concentration to levels which will eliminate the need for a fish consumption advisory and reduce human exposure to acceptable levels. The proposed interim action will result in major progress toward meeting these goals.

IV. DESCRIPTION OF PROPOSAL

A series of construction operations has been identified which relate to the potential stream diversion alternative for the Bryant Pond area. These operations and their proposed application are described in the following section. A preliminary cost estimate is included in the appendix along with qualifying notes and assumptions.

A. CLEAR AND GRUB

Prior to initiating stream diversion, the vegetative cover that currently blankets the west side of the site would need to be removed. To clear and grub this area, hand-held manual and power tools would be used to remove the reeds, swamp grasses, bushes, thickets, seedlings and other vegetation from this area. Completion of this activity may require a significant amount of manual labor at a considerable expense.

The vegetative cover should be removed to minimize differential settlement. The removal of roots and stumps is also included in this work item to protect the proposed stream liner from puncture and tears.

Once the vegetative cover is removed from the floodplain, the PCB-contaminated sediments may be easily eroded, particularly during times of high stream flow and precipitation events. An elevated risk of contaminant migration downstream will occur at this time, but the magnitude of this increase is currently undefined. To minimize erosion, the clearing and grubbing operation will be coordinated to progress just ahead of the placement of the stream channel liner. This construction sequence will significantly decrease the potential for the contaminant migration.

B. SEDIMENTATION DAMS

To further reduce the impact of any contaminants which migrate downstream, the erection of sedimentation dams has been included. These

filter-fabric type sedimentation dams would be installed at three or four downstream locations to remove migrating sediment from the water column. PCB-laden sediments collected at these dams, if any, could be removed and disposed of following the completion of upstream construction activities.

Because of the relatively fine particulate size of some of the sediments, some may permeate the sedimentation dams and pass through to downstream locations. While such actions may occur, the degree of PCB dispersion would likely be minimized by the dams.

C. ACCESS ROADS

Access roads will be necessary for the construction equipment to enter and leave the work area. These roads will likely be constructed throughout the entire length of the flood plain at once, rather than in a step-wise fashion. Figure 1 shows the location of the proposed access roads. The installation of these roads will facilitate the relocation of the stream by allowing construction equipment direct access to the proposed new stream channel. The stream channel will be discussed further in Section F.

It is probable that a sand base overlain with a geotextile and gravel will be used as a base for the 25 foot wide gravel roadway. This will help distribute the loading of the heavy equipment which will be using this road.

D. STREAM CROSSING

In addition to access roads into and along the flood plain areas, if easements can not be obtained, it is likely that some type of "bridge" over the stream will be necessary to enable access to areas of the flood plain for future actions. In particular, this crossing will be necessary to access the eastern bank of the upper pond flood plain, if it is not feasible to obtain an easement for ingree and egress through adjacent properties. If adequate access could be obtained through adjacent properties, the stream crossing could be eliminated.

The most likely place for a stream crossing would be at the constriction between the Upper and Lower Bryant Mill Ponds. If constructed at this location the crossing would be roughly equidistant from the upper and lower limits of the areas of contamination. The proposed crossing would be constructed by placing a series of galvanized steel culvert pipes to conduct the stream flow under the stream crossing. The crossing would then be constructed by successively placing and compacting layers of gravel to build up an embankment. It is estimated that the crossing will be approximately ten feet high and sixty feet in length. This "bridge" would have a fifteen foot driving surface and side slopes of 1 to 3. Approximately 1,000 cubic yards of gravel fill would be required to complete this structure.

E. DAM RENOVATION

The City of Kalamazoo is currently considering the replacement of the Alcott Street Bridge over Portage Creek. The bridge structure is integrally connected to the Alcott Street Dam; therefore renovation or replacement of the dam is potentially possible. Should the Alcott Street Dam undergo significant renovation, the stream diversion alternative may be modified to take advantage of a five foot hydraulic drop currently present on the dam spillway. It is planned that the bridge and dam alterations will be coordinated to be compatible with the proposed stream diversion alternative to maximize the environmental benefits of remediation. Allied recommends that the dam be permanently lowered to prevent any future reimpoundment of Bryant Mill Pond.

F. STREAM CHANNEL

The new stream channel would be installed following the construction of the access road and will most likely be located on the west side of the existing stream. For purposes of preparing preliminary cost estimates, the proposed new stream channel would be constructed to contain the 100 year

flood. All contaminated sediment would be moved from the location of the new stream channel as part of channel construction, and therefore the new channel will overlie only clean soils.

Rip rap would be used to line the stream channel. A stream channel lined with rip rap would consist of essentially a sand, liner and stone system. After excavating a new channel, the sand would be placed in the excavation covered by the geotextile and held in place by the rip rap.

G. EARTHWORK

Earthwork includes the rough grading of the new stream channel area to remove any mounds or hummocks and to facilitate the placement of the stream channel liner. Some earthwork will also be necessary to construct the access roads. This earthwork would be performed by small, amphibious, construction equipment and may require special flotation-type tires.

H. VEGETATIVE STABILIZATION

Upon completion of earthwork activities, the flood plain area in the vicinity of the new stream channel will be susceptible to erosional forces due to the absence of vegetative cover. As a component of the construction operations, temporary erosion control fencing will be installed at those areas susceptible to erosion. This temporary erosion fencing will remain in place until adequate vegetative cover can be established, at which time the temporary fencing would be removed.

I. EXISTING STREAM CHANNEL

The existing stream channel will be "impounded" in a dry condition after it is abandoned, using existing flood plain soils immediately upstream of Alcott Street Dam. This impounding will minimize the discharge of water which collects in the former creek bed. Downstream of the impounded area, a sediment trap will be installed to minimize the downstream migration of suspended particulates. Provisions for a flow control device at the

downstream end of the abandoned channel will be evaluated in the design phase. Surface water and sediment samples will be collected from this impounded area to determine any PCB contribution to the environment. Final remediation of the existing stream channel will be evaluated following the monitoring program as part of the final remedial action plan.

J. SEEP AREA

A groundwater spring in the "Seep 1" area, located upstream from the Bryant Pond area, flows through an area of contaminated sediments. As part of this remedial program, the groundwater spring will be isolated from these contaminated sediments to minimize potential sediment migration downstream. Preliminary design considerations include the passive separation of the groundwater spring from the contaminated sediments via an underground drainage system. The discharge from the underground drainage system would be monitored. This alternative will be more thoroughly evaluated during final design. Final remediation of the "Seep 1" area will be evaluated after the monitoring program as part of the final remediation action plan.

K. MONITORING PROGRAM

Following completion of the stream diversion, a monitoring program will be implemented to determine the effectiveness of the diversion and to provide necessary design information for subsequent actions. As described in the "Risk Assessment for Containment and Removal Alternatives", the stream diversion is projected to effectively reduce the present releases of PCB from Bryant Pond soils by approximately 94% based on available data. Portage Creek will be periodically monitored at Cork Street and Alcott Street after the stream is diverted to determine whether this projected effectiveness has been achieved. In addition, a groundwater monitoring program will be implemented to better define the releases of PCBs through groundwater migration to the creek and off-site. It is also proposed that fish in the new channel be collected and analyzed for PCB to further evaluate the effectiveness of stream diversion. This information will be

used to help select the most appropriate future action to address the sediments in Bryant Pond.

The monitoring program is proposed to be conducted over a 2 to 5 year period to allow for evaluation of the diversion effectiveness under a wide variety of environmental conditions and also to provide enough time to observe potential for migration of PCBs through groundwater. A detailed monitoring plan will be prepared as part of the design phase. The plan will include the monitoring schedules, station locations, and specific chemical and physical parameters that will be measured. It is preliminarily proposed that the monitoring plan consist of the following elements:

1) Surface Water Quality Monitoring for PCBs and Suspended Solids in:

   - Portage Creek at Cork Street
   - Portage Creek downstream of "Seep 1"
   - Portage Creek at Alcott Street
   - Abandoned stream channel in Bryant Pond
   - Storm Sewers that discharge to Bryant Pond
   - "Seep 1" drain

2) Groundwater Monitoring at Approximately 10 Wells Installed In and Up Gradient of Bryant Pond.

3) Monitoring of Fish PCB Concentrations in the New Channel.

The surface water sampling will provide information regarding PCB releases from the site after the stream is diverted. This data will be compared with existing data to determine the overall effectiveness of stream diversion. In addition, the data will provide necessary information regarding the rate of PCB releases to the creek via groundwater migration.

Other parameters that are proposed to be measured include flow rates in the new and abandoned channels in Bryant Pond and in the storm sewers flowing to Portage Creek, and water depths in the abandoned channel.

Groundwater studies are preliminarily proposed to augment the information on groundwater PCB transport rates. A network of approximately 10 monitoring wells would be installed in the Bryant Pond flood plain and upgradient of the pond to measure PCB distribution in groundwater and to evaluate whether PCBs are migrating offsite. In addition, hydrogeological parameters such as sediment/soil hydraulic gradients conductivity and hydraulic would also be evaluated along with physico-chemical parameters such as PCB partition coefficients to quantify the potential for offsite migration of PCB via groundwater.

It is also proposed that fish in the new channel be collected and analyzed for PCB after the stream is diverted. The fish monitoring may require that fish residing in Portage Creek prior to implementation be removed so that historically accumulated PCBs are not reflected in the results. The fish data should provide direct indication of the alternative effectiveness. The monitoring program as a whole will provide necessary information for the evaluation and selection of the most appropriate final remedial action alternative.

L. REMAINING RISKS AFTER IMPLEMENTATION OF STREAM DIVERSION

Stream diversion was evaluated as Alternative 2 in the "Preliminary Risk Assessment Report for Containment and Removal Alternatives". The upperbound cancer risks soley attributable to releases from Bryant Pond are estimated to be below 1 in 100,000 for all exposure routes except consumption of carp caught in Portage Creek which has an estimated upper bound cancer risk of approximately 1.7 in 100,000. The human health risks resulting from PCB releases from Bryant Pond soils after stream diversion are estimated to be approximately two orders of magnitude lower than risks resulting from other sources in the Kalamazoo River. Therefore, the stream diversion is estimated to be very effective and may reduce risks to levels that are below 1 in 100,000 which are well below risks that remain due to other sources in the Kalamazoo River. The monitoring program will provide information to refine the estimate of risks after stream diversion. The

most appropriate methods for addressing the Bryant Pond soils can then be better evaluated and selected so as to achieve acceptable levels of risk.

M. TIME OF IMPLEMENTATION

Figure 2 depicts the time line for the construction activities and monitoring program for the proposed interim stream diversion alternative. Construction can be completed within five months after start-up. The monitoring program is proposed to last 2 to 5 years after construction is completed.

V. CONCLUSION

Allied firmly believes that there are serious unresolved issues associated with the containment or removal alternatives. As noted above, they include, among others, implementability, effectiveness and cost. The proposed interim remedial action significantly and immediately reduces risk to human health and the environment. Substantial additional work is necessary before a final evaluation or assessment of containment or removal alternatives can take place.

There are undoubtedly ways to enhance stream diversion as an interim remedial action. Allied stands ready to meet with the State and consultants to discuss the proposal in more detail and to answer any questions which arise.

APPENDIX

Preliminary Cost Estimates

March 10, 1989

Allied Paper, Inc.
Kalamazoo, Michigan

Preliminary cost estimate
Stream Relocation

ITEM	QUANTITY	UNIT	UNIT COST	TOTAL COST	ASSUMPTIONS	REF
CLEAR, GRUB & ROOT REMOVAL	6	Acre	$3,175.00	$19,050	6" dia. trees, grub & chip stumps	Means
SEDIMENT DAMS	200	LF	$15.00	$3,000	3-4 dams, each up to 50' wide	OBG
ACCESS ROAD	4000	LF	$10.74	$42,960	gravel, 25' wide, 8" deep	Means
STREAM CHANNEL						
rip rap	4000	LF	$89.47	$357,880	6-12 inch limestone on geotex & sand	Vendor/OBG
EARTHWORK	27203	CY	$4.83	$131,390	rechannel	Vendor/OBG
SPREADING OF CHANNEL						
SPOILS	27203	CY	$4.83	$131,390	spread and grade material from new channel	Vendor/OBG
				$685,670	SUBTOTAL	
				$68,567	HEALTH & SAFETY at 10%	
				$171,418	CONTINGENCY at 25%	
				$68,567	OVERHEAD & PROFIT at 10%	
				$68,567	ENGINEERING at 10%	
				$1,062,789	GRAND TOTAL	

EXPLANATION OF CHANGES FROM ORIGINAL COST ESTIMATE DATED JAN. 12, 1989

The stream channel is now based on a estimated flow of 500 cfs. (for the 100 year storm); the original was based on 65 cfs.

Clear, Grub and Root Removal

The increase in the number of acres requiring clearing is a result of the larger stream channel which is needed to accommodate the increased flow.

Sediment Dams - No change.

Access Roads - No change.

Stream Channel

The length of the stream does not change, however the cost per linear foot increases to account for the larger channel cross-section. This reflects the additional sand, stone and geotextile needed to line the channel under the higher flow condition.

Earthwork

The quantity of soil which needs to bee moved to construct the new stream channel increases due to the larger channel cross-section.

Spreading of Channel Spoils

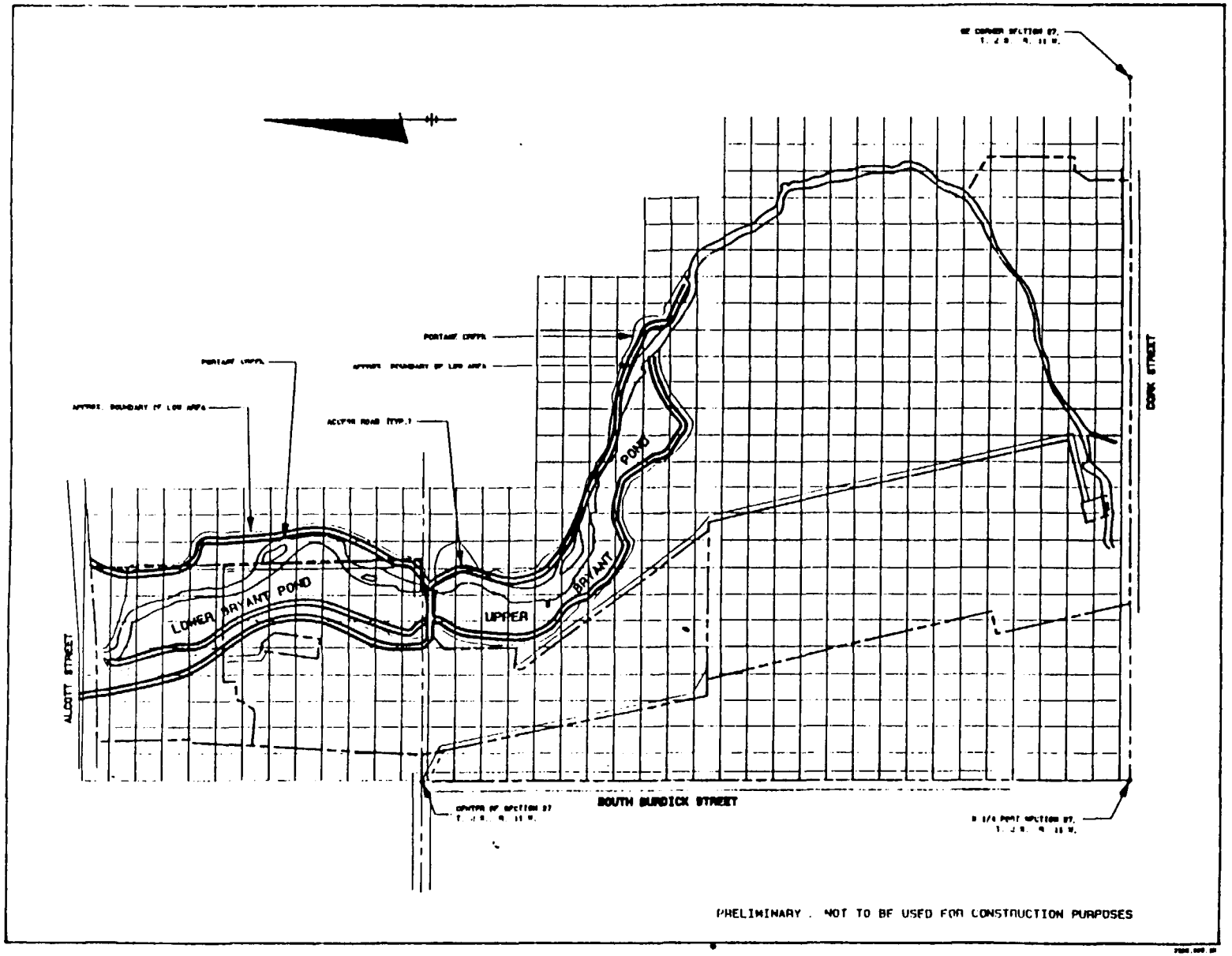
This line item has been added to allow for the material taken from the new stream channel to be spread on the floodplain. It is felt that such action will be necessary due to the increased volume of soil resulting from construction of the larger steam channel.

FIGURES

FIGURE 1

PROPOSED ACCESS ROADS

FIGURE NO. 1



NOTE :

FACILITIES SHOWN ARE FOR CONCEPTUAL PURPOSES ONLY. LOCATIONS OF FACILITIES MAY VARY DURING CONSTRUCTION OPERATIONS.

PORTAGE CREEK
ALLIED PROPERTY
PROPOSED ACCESS ROADS

JANUARY 1989

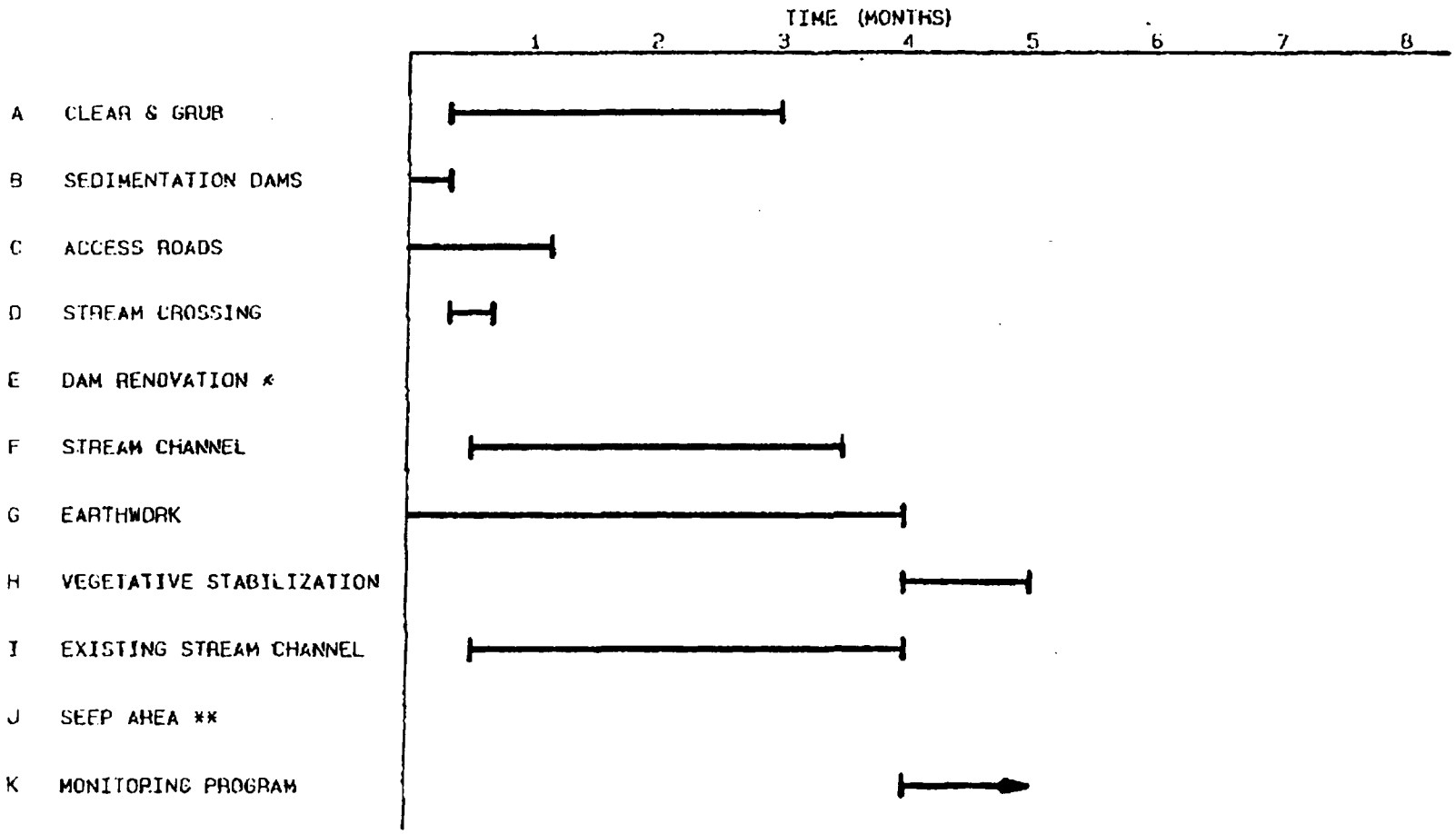
ENGINEERS, INC.

FIGURE 2

CONSTRUCTION TIME LINE

FIGURE NO. 2

TIME LINE FOR PROPOSED REMEDIAL RESPONSE
ALLIED PAPER, INC.
KALAMAZOO, MICHIGAN



* TO BE COMPLETED PRIOR TO COMMENCEMENT OF REMEDIAL ACTIVITIES

** VARIABLE

O'BRIEN & GERE ENGINEERS, INC.